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SCOATES' FARM MACHINERY LABORATORY MANUAL

FARM MACHINERY LABORATORY MANUAL

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PREFACE

This manual is primarily written for agricultural students attending Agricultural Colleges. The principal thing kept in mind in selecting, compiling and arranging the exercises was to stress only those things which are necessary to a thorough understanding of farm machinery, its selection, care and operation.

Three types of exercises will be found: those that deal with the examination of the machine from an investigational standpoint; those that call for the taking apart and reassembling, and those that test machines.

The first named exercises are to get the student familiar with the different parts of the machine, the principal differences in the various makes of the same type of machine and the function of each part. For these exercises there are questions asked, the answer to which the student must determine and jot down aside of the question. Blank spaces are left for these notations, or, if no blank space is left, the part of the question not applying to the machine can be crossed out. So when the machine is finally completed, there is a complete statement of the machine. Sufficient machines of the same kind should be gone over to fill out all the report sheets for that machine. After the report blanks for one kind of machine, such as walking plows or mowers, etc., are filled out, then the student should present himself to the instructor for a quiz on that machine. A grade will then be given.

In the case of assembling and testing exercises, the student does the exercise as per instructions in the manual and additional instructions from the instructor. All results should be carefully tabulated in manual.

Each student will need a manual and a pocket tape. As soon as getting the manual the student should write his name on it ink, thus insuring its return in case of loss. Not more than three students should work together if all are to get the maximum benefit of the course.

In using the machinery and apparatus in the laboratory, take care of it as well as you would if it were your own. Keep in mind that, while the machinery is loaned to us and the apparatus belongs to the State, yet there are many other students coming after you and they too wish to have good machinery and apparatus to use.

Do not rush through your laboratory work or do not loaf. Work right along making each moment count for the most. Get all you can out of the laboratory work. Do not run to the instructor with every little question, but try to rely upon yourself. Remember that the laboratory work is built on the assumption that you have the class room work in good shape; if you fail there, you are lost here.

WALKING PLOWS

EXERCISE NO. 1.

GENERAL INFORMATION.

Name of Plow..?
Manufacturer..?
Address ....?
Size..............................inches?

MOLDBOARD.

Material—steel, soft centered steel, chilled cast iron?
Solid, slat or rod?
Type—stubble, sod or general purpose?
Which way is the moldboard polished?
Is shin reinforced?

SHARE.

Slip or bar?
Point reinforced......................................?
Bearing at wing......................................inches?
Number of bolts that hold share on....................?

LANDSIDE.

High, medium, low?
Heel reinforced......................................?
Amount of vertical suction...................................inches?
Amount of horizontal suction...............................inches?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose?

BEAM.

Material—wood or steel?
Height of hitch { maximum.......................................inches?
{ minimum.......................................inches?
Greatest clearance......................................inches?
Clevis well made?
Can adjustment of hitch in horizontal and vertical directions be easily made..?

HANDLES.

Material—wood or steel?
How connected to plow?
Can they be adjusted?

MISCELLANEOUS.

Which of the plows studied do you prefer?

WALKING PLOWS

EXERCISE No. 1.

GENERAL INFORMATION.

Name of Plow..?
Manufacturer...?
Address ....?
Size................................inches?

MOLDBOARD.

Material—steel, soft centered steel, chilled cast iron?
Solid, slat or rod?
Type—stubble, sod or general purpose?
Which way is moldboard polished?
Is shin reinforced?

SHARE.

Slip or bar?
Point reinforced..................................?
Bearing at wing..................................inches?
Number of bolts that hold share on....................?

LANDSIDE.

High, medium, low?
Heel reinforced..................................?
Amount of vertical suction...............................inches?
Amount of horizontal suction...........................inches?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose?

BEAM.

Material—wood or steel?
Height of hitch { maximum...................................inches?
minimum ....inches?
Greatest clearance......................................inches?
Clevis well made?
Can adjustment of hitch in horizontal and vertical directions be easily made...?

HANDLES.

Material—wood or steel?
How connected to plow?
Can they be adjusted?

MISCELLANEOUS.

Which of the plows studied do you prefer?

WALKING PLOWS

GENERAL INFORMATION. EXERCISE NO. 1.

Name of Plow..?
Manufacturer...?
Address ....?
Size.............................inches?

MOLDBOARD.

Material—steel, soft centered steel, chilled cast iron?
Solid, slat or rod?
Type—stubble, sod or general purpose?
Which way is the moldboard polished?
Is shin reinforced?

SHARE.

Slip or bar?
Point reinforced.................................?
Bearing at wing..............................inches?
Number of bolts that hold share on.....................?

LANDSIDE.

High, medium, low?
Heel reinforced.................................?
Amount of vertical suction.............................inches?
Amount of horizontal suction..........................inches?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose?

BEAM.

Material—wood or steel?
Height of hitch { maximum..............................inches?
{ minimum ....inches?
Greatest clearance...............................inches?
Clevis well made?
Can adjustment of hitch in horizontal and vertical directions be easily made....................................?

HANDLES.

Material—wood or steel?
How connected to plow?
Can they be adjusted?

MISCELLANEOUS.

Which of the plows studied do you prefer?

WALKING HILLSIDE PLOWS

EXERCISE NO. 2,

GENERAL INFORMATION.

Name of Plow..?
Manufacturer..?
Address ....
Size...............................inches?

MOLDBOARD.

Material—steel, soft centerd steel or chilled cast iron.......................................?
Which way is moldboard polished?
Is shin reinforced.................................?
How does the shape differ from that of a common walking plow?

SHARE.

Slip or bar?
Point reinforced.................................?
Bearing at wing...............................inches?
Is hinge at point substantial and easily repaired ....?
Number of bolts that hold share on..........................?

LANDSIDE.

High, medium or low?
Heel reinforced.................................?
Amount of vertical suction..............................inches?
Amount of horizontal suction...........................inches?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose.............................?
Can locking device be adjustable to wear.................?

BEAM.

Material—wood or steel?
Heighth of hitch { maximum............................inches?
Heighth of hitch { minimum ....inches?
Greatest clearance...............................inches?
Clevis well made...............................?
Can adjustment of hitch in horizontal and vertical directions be easily made...?

HANDLES.

Material—wood or steel?
How connected to plow?
Can they be adjusted?

MISCELLANEOUS.

Do you understand how the plow is operated and what are its advantages...?

WALKING MIDDLEBREAKER

GENERAL INFORMATION. EXERCISE NO. 3.

Name of middlebreaker..?
Manufacturer..?
Address ....?
Size...................................inches?

MOLDBOARD.

Material—steel, soft centered steel or chilled cast iron?
Which way is moldboard polished?
Is shin reinforced.................................?

SHARE.

Point reinforced...................................?
Bearing at wing...................................inches?
Number of bolts that hold share on...........................?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose...............................?

RUDDER.

Has middlebreaker a rudder......................................?
Is it reinforced...................................?

BEAM.

Material—wood or steel?
Height of hitch { maximum.........................inches......?
{ minimum ....inches?
Greatest clearance....................................inches?
Clevis well made...............................?
Can adjustment of hitch in horizontal and vertical directions be easily made...?

HANDLES:

Materials—wood or steel?
How connected to plow....................................?
Can they be adjusted.....................................?

MISCELLANEOUS.

Which of the middlebreakers studied do you prefer?

WALKING MIDDLEBREAKER

EXERCISE NO. 3.

GENERAL INFORMATION.

Name of middlebreaker..?
Manufacturer..?
Address ....?
Size..................................inches?

MOLDBOARD.

Material—steel, soft centered steel or chilled cast iron?
Which way is moldboard polished?
Is shin reinforced..................................?

SHARE.

Point reinforced..................................?
Bearing at wing..................................inches?
Number of bolts that hold share on............................?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose..................................?

RUDDER.

Has middlebreaker a rudder..?
Is it reinforced..................................?

BEAM.

Material—wood or steel?
Height of hitch { maximum..........................inches......?
{ minimum ....inches?
Greatest clearance..................................inches?
Clevis well made..................................?
Can adjustment of hitch in horizontal and vertical directions be easily made..?

HANDLES:

Materials—wood or steel?
How connected to plow..................................?
Can they be adjusted..................................?

MISCELLANEOUS.

Which of the middlebreakers studied do you prefer?

SUBSOIL PLOWS

EXERCISE NO. 4.

GENERAL INFORMATION.

Name of Plow..?
Manufacturer...?
Address ....?
Size—width of shoe..................................inches; plowing depth............................inches?

SHOE.

Material—steel, cast iron or chilled cast iron?
How fastened to landbar..?
Point reinforced...?
Amount of vertical suction..............................inches?

LANDBAR.

Material—steel or cast iron?
Heel reinforced..................................?

STANDARD.

Material—steel or cast iron?
Is standard sharp..................................?

BEAM.

Material—wood or steel?
Height of hitch { maximum..................................inches?
{ minimum..................................inches?
Greatest clearance..................................inches?
Clevis well made...?
Can adjustment of hitch in horizontal and vertical directions be easily made...?
Has plow gauge shoe or wheel?

HANDLES.

Material—wood or steel?
How connected to plow?
Can they be adjusted..................................?

MISCELLANEOUS.

Do you understand how the plow is operated?
Which of the plows studied do you prefer?

SUBSOIL PLOWS

EXERCISE NO. 4.

GENERAL INFORMATION.

Name of Plow..?
Manufacturer...?
Address ....?
Size—width of shoe..............................inches; plowing depth...........................inches?

SHOE.

Material—steel, cast iron or chilled cast iron?
How fastened to landbar...?
Point reinforced...?
Amount of vertical suction..............................inches?

LANDBAR.

Material—steel or cast iron?
Heel reinforced.................................?

STANDARD.

Material—steel or cast iron?
Is standard sharp................................?

BEAM.

Material—wood or steel?
Height of hitch { maximum..............................inches?
{ minimum..............................inches?
Greatest clearance................................inches?
Clevis well made..?
Can adjustment of hitch in horizontal and vertical directions be easily made...?
Has plow gauge shoe or wheel?

HANDLES.

Material—wood or steel?
How connected to plow?
Can they be adjusted................................?

MISCELLANEOUS.

Do you understand how the plow is operated?
Which of the plows studied do you prefer?

SULKY AND GANG MOLDBOARD PLOWS

EXERCISE NO. 5.

GENERAL INFORMATION.

Name of plow..?
Manufacturer...?
Address ....?
Size—bottoms,...................................inches?

MOLDBOARD.

Material—steel, soft centered steel, chilled cast iron?
Solid, slat or rod?
Type—stubble, sod or general purpose?
Which way is the moldboard polished?
Is shin reinforced?

SHARE.

Slip or bar?
Point reinforced.....................................?
Bearing at wing....................................inches?
Number of bolts that hold share on..............................?

LANDSIDE.

With or without landslide?
High, medium or low?
Amount of vertical suction..................................inches?
Amount of horizontal suction..............................inches?
Can suction be varied.....................................?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose?

BEAM.

Frame or beam hitch?
Height of hitch (plow bottom on floor)...................... inches?
Greatest clearance......................................inches?
Clevis well made...?

FRAME. (*Answer for frame plow.*)

Frame rigid.....................................?
How many bails...................................?
All bearings of ample size...?
Can they be easily removed...?

Sulky and Gang Moldboard Plows

(*Continued*)

WHEELS.

Wheels substantially attached to beam?
Rear furrow wheel set over from landside................ inches?
Can these be adjusted?
All wheels open?
Has rear furrow wheel locking device?
Why are furrow wheels inclined?
Wheel boxes protected from dirt?
Easily oiled?

LEVERS.

Number of hand levers..................................?
Number of foot levers.......................................?
Purpose of each?
Can plow be set to float?
Plow bottom will clear ground.......................inches?

MANAGEMENT OF PLOW.

Tongue or tongueless?
How is plow guided.................................?
Plow make as good corner to right as to left?

MISCELLANEOUS.

Which of plows studied do you prefer?

SULKY AND GANG MOLDBOARD PLOWS

GENERAL INFORMATION. EXERCISE NO. 5.

Name of plow..?
Manufacturer..?
Address...?
Size—bottoms,..................................inches?

MOLDBOARD.

Material—steel, soft centered steel, chilled cast iron?
Solid, slat or rod?
Type—stubble, sod or general purpose?
Which way is the moldboard polished?
Is shin reinforced?

SHARE.

Slip or bar?
Point reinforced....................................?
Bearing at wing....................................inches?
Number of bolts that hold share on..............................?

LANDSIDE.

With or without landslide?
High, medium or low?
Amount of vertical suction....................................inches?
Amount of horizontal suction..............................inches?
Can suction be varied....................................?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose?

BEAM.

Frame or beam pitch?
Height of hitch (plow bottom on floor).................... inches?
Greatest clearance......................................inches?
Clevis well made......................................?

FRAME. (*Answer for frame plow.*)

Frame rigid......................................?
How many bails....................................?
All bearings of ample size..?
Can they be easily removed..?

Sulky and Gang Moldboard Plows

(*Continued*)

WHEELS.

Wheels substantially attached to beam?
Rear furrow wheel set over from landside.................inches?
Can these be adjusted?
All wheels open?
Has rear furrow wheel locking device?
Why are furrow wheels inclined?
Wheel boxes protected from dirt?
Easily oiled?

LEVERS.

Number of hand levers...................................?
Number of foot levers..?
Purpose of each?
Can plow be set to float?
Plow bottom will clear ground.......................inches?

MANAGEMENT OF PLOW.

Tongue or tongueless?
How is plow guided..................................?
Plow make as good corner to right as to left?

MISCELLANEOUS.

Which of plows studied do you prefer?

SULKY AND GANG MOLDBOARD PLOWS

EXERCISE NO. 5.

GENERAL INFORMATION.

Name of plow..?
Manufacturer..?
Address ....?
Size—bottoms,.................................inches?

MOLDBOARD.

Material—steel, soft centered steel, chilled cast iron?
Solid, slat or rod?
Type—stubble, sod or general purpose?
Which way is the moldboard polished?
Is shin reinforced?

SHARE.

Slip or bar?
Point reinforced..................................?
Bearing at wing..................................inches?
Number of bolts that hold share on.................inches?

LANDSIDE.

With or without landslide?
High, medium or low?
Amount of vertical suction..................................inches?
Amount of horizontal suction...........................inches?
Can suction be varied..................................?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose?

BEAM.

Frame or beam hitch?
Height of hitch (plow bottom on floor).................... inches?
Greatest clearance..................................inches?
Clevis well made..?

FRAME. (*Answer for frame plow.*)

Frame rigid..................................?
How many bails..................................?
All bearings of ample size..?
Can they be easily removed..?

Sulky and Gang Moldboard Plows

(*Continued*)

WHEELS.

Wheels substantially attached to beam?
Rear furrow wheel set over from landside................ inches?
Can these be adjusted?
All wheels open?
Has rear furrow wheel locking device?
Why are furrow wheels inclined?
Wheel boxes protected from dirt?
Easily oiled?

LEVERS.

Number of hand levers..................................?
Number of foot levers....................................?
Purpose of each?
Can plow be set to float?
Plow bottom will clear ground......................inches?

MANAGEMENT OF PLOW.

Tongue or tongueless?
How is plow guided................................?
Plow make as good corner to right as to left?

MISCELLANEOUS.

Which of plows studied do you prefer?

SINGLE DISC PLOWS

GENERAL INFORMATION. EXERCISE NO. 6.

Name of plow..?
Manufacturer..?
Address ....?

DISCS.

Diameter..............................inches?
Number of bolts attach disc to frame........ ....?
Disc bearing dust proof...................................?
Kind of bearing—plain, ball or roller?
Disc easily removed for sharpening..........................?
Scraper clean disc from center to edge?

WHEELS.

How do wheels of this plow differ from those of other plows?
Which wheels are inclined?
Why are they inclined?
Wheel boxes protected from dirt?
How are wheels greased?

LEVERS.

Number of hand levers.................................?
Number of foot levers..............................?
Purpose of each?
Disc will clear ground..................................inches?
Disc will plow..................................inches?

MANAGEMENT OF PLOW.

Reversible or non-reversible disc?
If reversible, how is it reversed?

MISCELLANEOUS.

Which of the plows studied do you prefer?

SINGLE DISC PLOWS

EXERCISE NO. 6.

GENERAL INFORMATION.

Name of plow..?
Manufacturer..?
Address ....?

DISCS.

Diameter.....................................inches?
Number of bolts attach disc to frame........................?
Disc bearing dust proof....................................?
Kind of bearing—plain, ball or roller?
Disc easily removed for sharpening..........................?
Scraper clean disc from center to edge?

WHEELS.

How do wheels of this plow differ from those of other plows?
Which wheels are inclined?
Why are they inclined?
Wheel boxes protected from dirt?
How are wheels greased?

LEVERS.

Number of hand levers.................................?
Number of foot levers...............................?
Purpose of each?
Disc will clear ground.....................................inches?
Disc will plow.....................................inches?

MANAGEMENT OF PLOW.

Reversible or non-reversible disc?
If reversible, how is it reversed?

MISCELLANEOUS.

Which of the plows studied do you prefer?

ENGINE GANG MOLDBOARD PLOWS

EXERCISE NO. 7.

GENERAL INFORMATION.

Name of Plow..?
Manufacturer..?
Address ....?
Size—bottom..................................inches?

MOLDBOARD.

Material—steel, soft centered steel, chilled cast iron?
Solid, slat or rod?
Type—stubble, sod or general purpose?
Which way is the moldboard polished?
Is shin reinforced?

SHARE.

Slip or bar.
Point reinforced..................................?
Bearing at wing..................................inches?
Number of bolts that hold share on..........................?

LANDSIDE.

High, medium or low.
Heel reinforced..................................?
Amount of vertical suction..................................inches?
Amount of horizontal suction..........................inches?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose..............................?

BEAM.

Frame or beam hitch?
Greatest clearance..................................inches?
Investigate hitch for completeness, range of adjustment and durability.
Hitch have brake pin..................................?

WHEELS.

All wheels open?
Which wheels have traction lugs..................................?
Wheels boxes protected from dirt..............................?
Easily oiled......................................?
Number of gauge wheels..................................?

Engine Gang Moldboard Plows

(*Continued*)

LEVERS.

Number levers..................................?
Purpose of each lever?
Number of plow bottoms operated by one lever?
Automatic lift?
If so, investigate operation.

MISCELLANEOUS.

Kind of coulters used..................................?
Any weed hooks..................................?
Which of the plows studied do you prefer?

ENGINE GANG MOLDBOARD PLOWS

GENERAL INFORMATION. EXERCISE NO. 7.

Name of Plow..?
Manufacturer..?
Address ....?
Size—bottom....................................inches?

MOLDBOARD.

Material—steel, soft centered steel, chilled cast iron?
Solid, slat or rod?
Type—stubble, rod or general purpose?
Which way is the moldboard polished?
Is shin reinforced?

SHARE.

Slip or bar.
Point reinforced.................................?
Bearing at wing..............................inches?
Number of bolts that hold share on.......................?

LANDSIDE.

High, medium or low.
Heel reinforced.................................?
Amount of vertical suction.............................inches?
Amount of horizontal suction.......................inches?

FROG.

Material—steel, cast iron or malleable?
Is it large enough for its purpose............................?

BEAM.

Frame or beam hitch?
Greatest clearance...............................inches?
Investigate hitch for completeness, range of adjustment and durability.
Hitch have brake pin.................................?

WHEELS.

All wheels open?
Which wheels have traction lugs...............................?
Wheels boxes protected from dirt...........................?
Easily oiled.............................?
Number of gauge wheels.................................?

Engine Gang Moldboard Plows

(*Continued*)

LEVERS.

Number levers.................................?
Purpose of each lever?
Number of plow bottoms operated by one lever?
Automatic lift?
If so, investigate operation.

MISCELLANEOUS.

Kind of coulters used..................................?
Any weed hooks.................................?
Which of the plows studied do you prefer?

ENGINE GANG DISC PLOW

GENERAL INFORMATION. EXERCISE NO. 8.

Name of Plow..?
Manufacturer..?
Address ....?

DISCS.

Number..................................?
Diameter..................................inches?
Number of bolts attach disc to frame......................?
Disc bearing dust proof..................................?
Kind of bearing—plain, ball or roller?
Disc easily removed for sharpening...........................?
Scraper clean disc from center to edge?

WHEELS.

Number..................................?
Wheel boxes protected from dirt?
Easily lubricated..................................?

LEVERS.

Number of hand levers..................................?
Purpose of each?
Discs will clear ground..................................inches?
Discs will plow..................................inches?

MANAGEMENT OF PLOW.

Investigate hitch for completeness, range of adjustment and durability.

MISCELLANEOUS.

Which of the plows studied do you prefer?

ENGINE GANG DISC PLOW

EXERCISE NO. 8.

GENERAL INFORMATION.

Name of Plow..?
Manufacturer..?
Address ....?

DISCS.

Number....................................?
Diameter..................................inches?
Number of bolts attach disc to frame.......................?
Disc bearing dust proof......................................?
Kind of bearing—plain, ball or roller?
Disc easily removed for sharpening............................?
Scraper clean disc from center to edge?

WHEELS.

Number....................................?
Wheel boxes protected from dirt?
Easily lubricated.......................................?

LEVERS.

Number of hand levers.......................................?
Purpose of each?
Discs will clear ground.......................................inches?
Discs will plow.......................................inches?

MANAGEMENT OF PLOW.

Investigate hitch for completeness, range of adjustment and durability.

MISCELLANEOUS.

Which of the plows studied do you prefer?

COULTERS AND JOINERS

ROLLING COULTER. EXERCISE NO. 9.

Manufacturer..?
Address ....?
Diameter..............................inches?
Adjustment for ordinary plowing?
Adjustment for stumpy land plowing?

KNIFE COULTER.

Manufacturer..?
Address ....?
Length of blade..............................inches?
Adjustment for ordinary plowing?
Adjustment for stumpy land plowing?

FIN COULTER.

Manufacturer..?
Address ....?
To what part of the plow is coulter attached?

JOINTER.

Manufacturer..?
Address ....?
Adjustments?

COMBINED ROLLING COULTER AND JOINER.

Manufacturer..?
Address ....?
Adjustments?

SPIKE TOOTH HARROW

EXERCISE No. 10.

GENERAL INFORMATION.

Name of harrow..?
Manufacturer..?
Address ....?

TEETH.

Length....................................inches?
Diameter....................................inches?
Shape—square, diamond, oval or round?
Have teeth heads....................................?
Why are some teeth longer than others and have curved tops?
How are teeth fastened to frame?
How many teeth per square foot of frame?
Fixed or adjustable?

FRAME.

Flexible or rigid?
Material—wood or steel?
Frame well made and braced?
Connection to eveners—cast, malleable or forging?
Connections easily removed....................................?

LEVERS.

Number....................................?
Purpose of each?

MISCELLANEOUS.

Which of the harrows studied do you prefer?

SPIKE TOOTH HARROW

EXERCISE NO. 10.

GENERAL INFORMATION.

Name of harrow..?
Manufacturer...?
Address ....?

TEETH.

Length...................................inches?
Diameter..................................inches?
Shape—square, diamond, oval or round?
Have teeth heads.................................?
Why are some teeth longer than others and have curved tops?
How are teeth fastened to frame?
How many teeth per square foot of frame?
Fixed or adjustable?

FRAME.

Flexible or rigid?
Material—wood or steel?
Frame well made and braced?
Connection to eveners—cast, malleable or forging?
Connections easily removed..................................?

LEVERS.

Number.....................................?
Purpose of each?

MISCELLANEOUS.

Which of the harrows studied do you prefer?

STALK CUTTERS

EXERCISE No. 11.

GENERAL INFORMATION.

Name of stalk cutter..?
Manufacturer...?
Address ....?
Single or double?

CUTTER HEAD.

Knives number....................................?
Knives—straight or curved?
Material in spiders—cast or malleable?
Diameter of cutter head....................................inches?
Does shaft go clear through cutter head....................?
Is center of cutter head clear......................................?
Bearings protected from dirt..?

FRAME.

Strong and well braced...?
Spring hitch....................................?
Hitch adjustable.................................?

LEVERS.

Number....................................?
Purpose of each...?

WHEELS.

Material—steel or cast iron?
Boxes protected from dirt?
Easily lubricated?

MISCELLANEOUS.

Which of the stalk cutters studied do you prefer?

STALK CUTTERS

EXERCISE NO. 11.

GENERAL INFORMATION.

Name of stalk cutter..?
Manufacturer..?
Address ....?
Single or double?

CUTTER HEAD.

Knives number..................................?
Knives—straight or curved?
Material in spiders—cast or malleable?
Diameter of cutter head..................................inches?
Does shaft go clear through cutter head..................?
Is center of cutter head clear..?
Bearings protected from dirt..?

FRAME.

Strong and well braced..?
Spring hitch.................................?
Hitch adjustable................................?

LEVERS.

Number................................?
Purpose of each...?

WHEELS.

Material—steel or cast iron?
Boxes protected from dirt?
Easily lubricated?

MISCELLANEOUS.

Which of the stalk cutters studied do you prefer?

DISC HARROW

EXERCISE NO. 12.

GENERAL INFORMATION.

Name of harrow..?
Manufacturer...?
Address ....?

DISC.

Diameter..................................inches?
Number...................................?
Kind—full, cutaway or spading?
Distance between discs.................................inches?
Total width....................feet....................inches?
Amount of dish................................inches?
Which way does disc face: out or in?
Disc reversible?

BEARINGS.

Number.................................?
Material—cast or malleable?
Bushings—wood, iron, babbitt or brass?
Bearings easily lubricated.................................?
Oil or grease used?
Bumpers used.................................?

SCRAPERS.

Moving or stationary?
Will they do the work?

LEVERS.

Number hand.................................?
Number foot.................................?
Purpose of each?
Easy to operate?

FRAME.

Number of standards.................................?
Amount of clearance between discs and standards.................................?

HITCH.

Stub or full tongue?
Tongue truck.................................?
Can height of hitch be adjusted?

MISCELLANEOUS.

Weight pans.................................?
Method of transporting..?
Which of the harrows studied do you prefer?

DISC HARROW

EXERCISE NO. 12.

GENERAL INFORMATION.

Name of harrow..?
Manufacturer...?
Address ....?

DISC.

Diameter....................................inches?
Number.....................................?
Kind—full, cutaway or spading?
Distance between discs..................................inches?
Total width....................feet....................inches?
Amount of dish.................................inches?
Which way does disc face: out or in?
Disc reversible?

BEARINGS.

Number..................................?
Material—cast or malleable?
Bushings—wood, iron, babbitt or brass?
Bearings easily lubricated.................................?
Oil or grease used?
Bumpers used.................................?

SCRAPERS.

Moving or stationary?
Will they do the work?

LEVERS.

Number hand.................................?
Number foot.................................?
Purpose of each?
Easy to operate?

FRAME.

Number of standards.................................?
Amount of clearance between discs and standards.................................?

HITCH.

Stub or full tongue?
Tongue truck...?
Can height of hitch be adjusted?

MISCELLANEOUS.

Weight pans.................................?
Method of transporting...?
Which of the harrows studied do you prefer?

DISC HARROW

EXERCISE NO. 12.

GENERAL INFORMATION.

Name of harrow..?
Manufacturer..?
Address ....?

DISC.

Diameter................................inches?
Number................................?
Kind—full, cutaway or spading?
Distance between discs................................inches?
Total width....................feet....................inches?
Amount of dish................................inches?
Which way does disc face: out or in.
Disc reversible?

BEARINGS.

Number................................?
Material—cast or malleable?
Bushings—wood, iron, babbitt or brass?
Bearings easily lubricated................................?
Oil or grease used?
Bumpers used................................?

SCRAPERS.

Moving or stationary?
Will they do the work?

LEVERS.

Number hand................................?
Number foot................................?
Purpose of each?
Easy to operate?

FRAME.

Number of standards................................?
Amount of clearance between discs and standards................................?

HITCH.

Stub or full tongue?
Tongue truck..?
Can height of hitch be adjusted?

MISCELLANEOUS.

Weight pans................................?
Method of transporting...?
Which of the harrows studied do you prefer?

DOUBLE ACTING DISC HARROW

EXERCISE NO. 13.

GENERAL INFORMATION.

Name of harrow..?
Manufacturer..?
Address ....?

DISC.

Number in each gang...?
Number of gangs....................................?
Kind—full, cutaway or spading....................................?
Diameter....................................inches?
Distance between discs....................................inches?
Total width............................feet..........................inches?
Amount of dish..................................inches?
Which way does disc face: out or in.........................?

BEARINGS.

Number....................................?
Material—cast or malleable?
Bushings—wood, iron, babbit or brass?
Bearings easily lubricated....................................?
Oil or grease used....................................?
Bumpers used....................................?

SCRAPERS.

Moving or stationary...?
Will they do the work....................................?

LEVERS.

Number hand....................................?
Number foot....................................?
Purpose of each..?
Easy to operate...?

FRAME.

Number of standards....................................?
Amount of clearance between discs and standards
....................................inches?
Examine flexibility of frame when turning.

MISCELLANEOUS.

Weight of pans...?
Method of transporting...?
Which of the harrows studied do you prefer?

DOUBLE ACTING DISC HARROW

EXERCISE NO. 13.

GENERAL INFORMATION.

Name of harrow..........?
Manufacturer..........?
Address..........?

DISC.

Number in each gang..........?
Number of gangs..........?
Kind—full, cutaway or spading..........?
Diameter..........inches?
Distance between discs..........inches?
Total width..........feet..........inches?
Amount of dish..........inches?
Which way does disc face: out or in..........?

BEARINGS.

Number..........?
Material—cast or malleable?
Bushings—wood, iron, babbit or brass?
Bearings easily lubricated..........?
Oil or grease used..........?
Bumpers used..........?

SCRAPERS.

Moving or stationary..........?
Will they do the work..........?

LEVERS.

Number hand..........?
Number foot..........?
Purpose of each..........?
Easy to operate..........?

FRAME.

Number of standards..........?
Amount of clearance between discs and standards ....inches?
Examine flexibility of frame when turning.

MISCELLANEOUS.

Weight of pans..........?
Method of transporting..........?
Which of the harrows studied do you prefer?

LAND ROLLERS AND PULVERIZERS

EXERCISE NO. 14.

GENERAL INFORMATION.

Name ....?
Manufacturer..?
Address ....?
Width..................................feet?
Weight..........................pounds?

ROLLERS.

Diameter...................................inches?
Width...inches?
Number..................................?
Kind rollers surface..?
All rollers alike..?
Number of gangs of rollers...?

FRAME.

Material—wood or steel..?
Corners reinforced...?
Standards—cast iron or steel..?
Bearings—cast iron or wood..?
Easily lubricated..?
Bearings constructed to exclude dirt..............................?
Diameter of axle...............................inches?

MISCELLANEOUS.

Which of rollers studied do you prefer?

LAND ROLLERS AND PULVERIZERS

EXERCISE NO. 14.

GENERAL INFORMATION.

Name ....?
Manufacturer...?
Address ....?
Width.................................feet?
Weight...........................pounds?

ROLLERS.

Diameter...................................inches?
Width......................................inches?
Number................................?
Kind rollers surface...?
All rollers alike..?
Number of gangs of rollers..?

FRAME.

Material—wood or steel..?
Corners reinforced..?
Standards—cast iron or steel.......................................?
Bearings—cast iron or wood..?
Easily lubricated...?
Bearings constructed to exclude dirt............................?
Diameter of axle.................................inches?

MISCELLANEOUS.

Which of rollers studied do you prefer?

ONE ROW CORN PLANTER

GENERAL INFORMATION. EXERCISE NO. 15.

Name of planter..?
Manufacturer..?
Address ....?

SEED BOX.

Number..................................?
Kinds of seed can be sown..?
Can two kinds of seed be sown at once..................?
What kinds..?
Corn plates—edge selection or round hole?
Cotton seed sown in bunches or separately?
Is box hinged..................................?

FURROW OPENER.

Kind—stub, curved shoe or hoe?
Number of valves in planter shank?
Depth gauge..................................?
Can corn and soy beans be planted at the same time at different depths?

FRAME.

Well made and braced......................................?
Handles adjustable......................................?

WHEELS.

Diameter press wheel..inches?
Does press wheel generate power..................................?
How is power thrown in and out of gear?
Is there a front wheel......................................?

LEVERS.

Number.....................................?
Purpose of each?

MISCELLANEOUS.

Fertilizer attachment......................................?
Which of planters studied do you prefer?

ONE ROW CORN PLANTER

EXERCISE NO. 15.

GENERAL INFORMATION.

Name of planter..........?
Manufacturer..........?
Address..........?

SEED BOX.

Number..........?
Kinds of seed can be sown..........?
Can two kinds of seed be sown at once..........?
What kinds..........?
Corn plates—edge selection or round hole?
Cotton seed sown in bunches or separately?
Is box hinged..........?

FURROW OPENER.

Kind—stub, curved shoe or hoe?
Number of valves in planter shank?
Depth gauge..........?
Can corn and soy beans be planted at the same time at different depths?

FRAME.

Well made and braced..........?
Handles adjustable..........?

WHEELS.

Diameter press wheel..........inches?
Does press wheel generate power..........?
How is power thrown in and out of gear?
Is there a front wheel..........?

LEVERS.

Number..........?
Purpose of each?

MISCELLANEOUS.

Fertilizer attachment..........?
Which of planters studied do you prefer?

ONE ROW CORN PLANTER

General Information. Exercise No. 15.

Name of planter..?
Manufacturer...?
Address ....?

Seed Box.

Number..............................?
Kinds of seed can be sown....................................?
Can two kinds of seed be sown at once..................?
What kinds..?
Corn plates—edge selection or round hole?
Cotton seed sown in bunches or separately?
Is box hinged.................................?

Furrow Opener.

Kind—stub, curved shoe or hoe?
Number of valves in planter shank?
Depth gauge.................................?
Can corn and soy beans be planted at the same time at different depths?

Frame.

Well made and braced.................................?
Handles adjustable....................................?

Wheels.

Diameter press wheel.....................................inches?
Does press wheel generate power.............................?
How is power thrown in and out of gear?
Is there a front wheel.................................?

Levers.

Number..................................?
Purpose of each?

Miscellaneous.

Fertilizer attachment..?
Which of planters studied do you prefer?

TWO ROW CORN PLANTERS

EXERCISE NO. 16.

GENERAL INFORMATION.

Name of planter..?
Manufacturer..?
Address ....?

SEED BOX.

Number..................................?
Kinds of seed sown..?
Can two kinds of seed be sown at once.......................?
What kinds..?
Corn plates—edge selection or round hole?
Cotton seed sown in bunches or separately?
Are boxes hinged..................................?
Seed drilled, checked or both?
Checked corn drop—cumulative or full hill?

FURROW OPENER.

Kind—stub, curved shoe, single or double disc?
Number of valves in planter shank...........................?
Can corn and soy beans be planted at same time at different depths......................................?
What effect does a short neck strap have on uniformity and depth of planting?

LEVERS.

Number hand levers..............................?
Number foot levers..............................?
Purpose of each?
Can drop be changed while planter is in motion ....?

CHECKING ATTACHMENT.

Vertical or horizontal checking bar?
Where is reel attached..?

FRAME.

Maximum width of rows......................................feet?
Minimum width of rows..feet?
Frame well made and braced.......................................?

WHEELS.

Kind—open, solid, concave, flat or double?
Cleaners..................................?
Easily lubricated..................................?

MISCELLANEOUS.

What kind of marker..................................?
Fertilizer attachment..................................?
Which of planters studied do you prefer?

TWO ROW CORN PLANTERS

EXERCISE NO. 16.

GENERAL INFORMATION.

Name of planter..?
Manufacturer..?
Address ....?

SEED BOX.

Number..................................?
Kinds of seed sown..?
Can two kinds of seed be sown at once....................?
What kinds..?
Corn plates—edge selection or round hole?
Cotton seed sown in bunches or separately?
Are boxes hinged..................................?
Seed drilled, checked or both?
Checked corn drop—cumulative or full hill?

FURROW OPENER.

Kind—stub, curved shoe, single or double disc?
Number of valves in planter shank..........................?
Can corn and soy beans be planted at same time at different depths..................................?
What effect does a short neck strap have on uniformity and depth of planting?

LEVERS.

Number hand levers..............................?
Number foot levers.............................?
Purpose of each?
Can drop be changed while planter is in motion ....?

CHECKING ATTACHMENT.

Vertical or horizontal checking bar?
Where is reel attached..?

FRAME.

Maximum width of rows..................................feet?
Minimum width of rows..feet?
Frame well made and braced..?

WHEELS.

Kind—open, solid, concave, flat or double?
Cleaners.................................?
Easily lubricated.................................?

MISCELLANEOUS.

What kind of marker..................................?
Fertilizer attachment..................................?
Which of planters studied do you prefer?

POTATO PLANTER

EXERCISE NO. 17.

GENERAL INFORMATION.

Name of planter..?
Manufacturer..?
Address ....?

SEED BOX.

Material—canvas, wood or steel?
Capacity, bushels.................................?
Seed dropped by knives, elevator or rotary table?
Seed liable to be damaged by dropping device?
Distance between seed adjustable?

FURROW OPENER.

Kind..?
Depth of planting adjustable?

FURROW COVERS.

Kind..?
Adjustable..?
Bearings easily oiled?

LEVERS.

Number......................................?
Purpose of each?

WHEELS.

Diameter.............................feet......................inches.
Width of tire................................inches?
Boxes protected from dirt?
Easily lubricated?

MISCELLANEOUS:

Number of men to operate..................................?
Fertilizer attachment?
What kind of marker..?
Which of the planters studied do you prefer?

POTATO PLANTER

GENERAL INFORMATION. EXERCISE NO. 17.

Name of planter..?
Manufacturer..?
Address ....?

SEED BOX.

Material—canvas, wood or steel?
Capacity, bushels....................................?
Seed dropped by knives, elevator or rotary table?
Seed liable to be damaged by dropping device?
Distance between seed adjustable?

FURROW OPENER.

Kind...?
Depth of planting adjustable?

FURROW COVERS.

Kind...?
Adjustable...?
Bearings easily oiled?

LEVERS.

Number...?
Purpose of each?

WHEELS.

Diameter..............................feet.........................inches.
Width of tire..................................inches?
Boxes protected from dirt?
Easily lubricated?

MISCELLANEOUS:

Number of men to operate....................................?
Fertilizer attachment?
What kind of marker..?
Which of the planters studied do you prefer?

BROADCASTERS

EXERCISE NO. 18.

WHEELBARROW.

Name ....?
Manufacturere..?
Address ....
depth..inches?
Seed box width..inches?
length....................feet....................inches?
Investigate how power is generated and applied?
Can amount of seed sown be adjusted....................?
Kinds of seed can be sown..?

KNAPSACK SEEDER.

Name ....?
Manufacturer..?
Address ....?
Capacity of bag....................quarts?
Investigate how power is generated and applied?
Can amount of seed sown be adjusted?
Kinds of seed can be sown..?

ENDGATE SEEDER.

Name ....?
Manufacturer..?
Address ....?
Capacity of seed box....................quarts?
Investigate how power is generated and applied.
Can amount of seed sown be adjusted....................?
Number of scattering fans....................?
Force feed....................?
Agitator....................?
Grass seed attachment....................?

TWO-WHEEL SEEDER.

Name ....?
Manufacturer..?
Address ....?
depth..inches?
Seed box average width....................inches?
length ....feet....................inches?
Investigate how power is generated and applied.
Can amount of seed sown be adjusted?
Force feed....................?
Agitator....................?
Grass seed attachment..?

GRAIN DRILLS

GENERAL INFORMATION. EXERCISE NO. 19.

Name of drill..?
Manufacturer...?
Address ....?
Size.................furrow openers..............distance apart?

SEED BOX.

Cubical contents..............................cubic inches?
Shape of end...?
Trussed..?
Metal or wood bottom?
Agitator..?
Grass seed attachment...?
Fertilizer attachment.....................................?
Will all seed go into seed cups when box is about empty...............................?

VALVES.

Seed shells, single or double?
Seed shaft driven by chain or shaft drive................?
Feed regulated by speed of shaft or exposure of seed shell?
Kinds of seed can be sown...?

SEED TUBES.

Material—rubber, wire or spiral spring?

FURROW OPENER.

Kind—hoe, shoe, single or double disc?
Staggered or in line?
Can spacing be varied...................................?
Disc bearings easily lubricated?
Disc bearing take up enough room to cause clogging?

FRAME.

Well braced and balanced...................................?
Reinforced corners...................................?
Single or double draw bars for furrow openers?
Main axle bearings—plain, roller, self-aligining?

LEVERS.

Number....................................?
Purpose of each?

WHEELS.

Wood or steel?
Diameter..................................feet..............................inches?
Width...inches?

MISCELLANEOUS.

Covering chains or press wheels?
Which of the grain drills studied do you prefer?

GRAIN DRILLS

EXERCISE NO. 19.

GENERAL INFORMATION.

Name of drill..?
Manufacturer..?
Address ....?
Size................furrow openers..............distance apart?

SEED BOX.

Cubical contents..............................cubic inches?
Shape of end..?
Trussed..?
Metal or wood bottom?
Agitator..?
Grass seed attachment................................?
Fertilizer attachment................................?
Will all seed go into seed cups when box is about empty..................................?

VALVES.

Seed shells, single or double?
Seed shaft driven by chain or shaft drive.............?
Feed regulated by speed of shaft or exposure of seed shell?
Kinds of seed can be sown..?

SEED TUBES.

Material—rubber, wire or spiral spring?

FURROW OPENER.

Kind—hoe, shoe, single or double disc?
Staggered or in line?
Can spacing be varied..................................?
Disc bearings easily lubricated?
Disc bearing take up enough room to cause clogging?

FRAME.

Well braced and balanced..................................?
Reinforced corners..................................?
Single or double draw bars for furrow openers?
Main axle bearings—plain, roller, self-aligining?

LEVERS.

Number..................................?
Purpose of each?

WHEELS.

Wood or steel?
Diameter..................................feet..........................inches?
Width..inches?

MISCELLANEOUS.

Covering chains or press wheels?
Which of the grain drills studied do you prefer?

TWO WHEEL CULTIVATOR

GENERAL INFORMATION. EXERCISE NO. 20.

Name of cultivator..?
Manufacturer...?
Address ....?
Single or double row?
Riding, walking or combined?

SHOVELS.

Number to gang...............................?
Width..............................inch?
Spring trip or break pin?
Shovel adjustable..............................?
Spring tooth attachment..............................?
Disc attachment..............................?

SHIELDS.

Kind—sheet or rod?
Adjustable..............................?

GANGS OR RIGS.

Number of shovels to gangs..............................?
Method of guiding gangs—foot, pivotal wheel or seat shift?
Gangs remain horizontal when moved right or left?
Can gangs be moved independent of one another ....?
Connection to frame flexible..............................?
Connection adjustable for wear..............................?
Spreading arch..............................?
Can distance between gangs be quickly changed ....?

FRAME.

Balanced frame..............................?
Seat—kind..............................?
How high corn can be cultivated....................inches?

WHEELS.

Diameter ....feet..............................inches?
Width..............................inches?
Expanding axle..............................?
Close as wheels can be put together....................feet?
Widest wheels can be separated....................feet?
Wheel boxes protected against dirt..............................?

Two Wheel Cultivator

(*Continued*)

LEVERS.

Number..................................?
Purpose of each?
Does spring aid in lifting gangs..................................?
Can spring be regulated..................................?
Are levers easily operated from seat..........................?

MISCELLANEOUS.

Pivotal tongue..................................?
Height of hitch variable..................................?
Which of cultivators studied do you prefer?

TWO WHEEL CULTIVATOR

GENERAL INFORMATION. EXERCISE NO. 20.

Name of cultivator..?
Manufacturer..?
Address ....?
Single or double row?
Riding, walking or combined?

SHOVELS.

Number to gang...................................?
Width..................................inch?
Spring trip or break pin?
Shovel adjustable...................................?
Spring tooth attachment...................................?
Disc attachment...................................?

SHIELDS.

Kind—sheet or rod?
Adjustable...................................?

GANGS OR RIGS.

Number of shovels to gangs...................................?
Method of guiding gangs—foot, pivotal wheel or seat shift?
Gangs remain horizontal when moved right or left?
Can gangs be moved independent of one another ....?
Connection to frame flexible...?
Connection adjustable for wear.......................................?
Spreading arch...................................?
Can distance between gangs be quickly changed ....?

FRAME.

Balanced frame...................................?
Seat—kind...................................?
How high can corn be cultivated.....................inches?

WHEELS.

Diameter ....feet...............................inches?
Width..................................inches?
Expanding axle...................................?
Close as wheels can be put together...................feet?
Widest wheels can be separated...........................feet?
Wheel boxes protected against dirt............................?

Two Wheel Cultivator

(*Continued*)

LEVERS.

Number..................................?
Purpose of each?
Does spring aid in lifting gangs..................................?
Can spring be regulated..................................?
Are levers easily operated from seat..........................?

MISCELLANEOUS.

Pivotal tongue..................................?
Height of hitch variable..................................?
Which of cultivators studied do you prefer?

TWO WHEEL CULTIVATOR

GENERAL INFORMATION. EXERCISE NO. 20.

Name of cultivator..?
Manufacturer..?
Address ....?
Single or double row?
Riding, walking or combined?

SHOVELS.

Number to gang..................................?
Width..................................inch?
Spring trip or break pin?
Shovel adjustable..................................?
Spring tooth attachment..................................?
Disc attachment..................................?

SHIELDS.

Kind—sheet or rod?
Adjustable..................................?

GANGS OR RIGS.

Number of shovels to gangs..................................?
Method of guiding gangs—foot, pivotal wheel or seat shift?
Gangs remain horizontal when moved right or left?
Can gangs be moved independent of one another ....?
Connection to frame flexible..................................?
Connection adjustable for wear..................................?
Spreading arch..................................?
Can distance between gangs be quickly changed ....?

FRAME.

Balanced frame..................................?
Seat—kind..................................?
How high corn can be cultivated.........................inches?

WHEELS.

Diameter ....feet..................................inches?
Width..................................inches?
Expanding axle..................................?
Close as wheels can be put together..................feet?

Two Wheel Cultivator

(Continued)

Widest wheels can be separated..............................feet?
Wheel boxes protected against dirt..............................?

LEVERS.

Number....................................?
Purpose of each?
Does spring aid in lifting gangs....................................?
Can spring be regulated....................................?
Are levers easily operated from seat..........................?

MISCELLANEOUS.

Pivotal tongue....................................?
Height of hitch variable....................................?
Which of cultivators studied do you prefer?

MOWER

GENERAL INFORMATION.

EXERCISE NO. 21.

Name of mower..?
Manufacturer...?
Address ....?
Width of cut...............................feet?

CUTTER BAR.

Ledger plates—smooth or serrated?
Any wearing plates.................................?
Investigate method of aligning bar?
Is weight of bar carried on frame...........................?

SICKLE.

Number of section...?
How is pitman connected to sickle............................?
For each revolution of main wheels how many times does sickle move back and forth?

PITMAN.

Material—wood or steel?
Method of lubricating crank end?
Bearing bushing at crank end—iron, babbitt or bronze?
Can bushing be replaced?

WHEELS.

Diameter...........................feet............................inches?
Ratchet inside or outside of wheel?
Pawls, loose or fastened in place?

LEVERS.

Number hand levers.................................?
Number foot levers................................?
Purpose of each?
Can cutter bar be thrown in a vertical position by operator while in the seat?
Distance mower will travel after clutch is thrown in before sickle starts.................................inches?
When the tilting lever is moved from the first to the last notch, is the outer end of the cutter bar moved in a horizontal direction without the inner end being moved the same amount...........?

GEARING.

Main gear—internal or external?
Is gearing well protected...?
Easily lubricated...?
Variable speed mower..?

MISCELLANEOUS.

Which of the mowers studied do you prefer?

MOWER

EXERCISE NO. 21.

GENERAL INFORMATION.

Name of mower..?
Manufacturer..?
Address ....?
Width of cut..................................feet?

CUTTER BAR.

Ledger plates—smooth or serrated?
Any wearing plates....................................?
Investigate method of aligning bar?
Is weight of bar carried on frame...............................?

SICKLE.

Number of section..?
How is pitman connected to sickle...............................?
For each revolution of main wheels how many times does sickle move back and forth?

PITMAN.

Material—wood or steel?
Method of lubricating crank end?
Bearing bushing at crank end—iron, babbitt or bronze?
Can bushing be replaced?

WHEELS.

Diameter..............................feet..............................inches?
Ratchet inside or outside of wheel?
Pawls, loose or fastened in place?

LEVERS.

Number hand levers...................................?
Number foot levers...................................?
Purpose of each?
Can cutter bar be thrown in a vertical position by operator while in the seat?
Distance mower will travel after clutch is thrown in before sickle starts....................................inches?
When the tilting lever is moved from the first to the last notch, is the outer end of the cutter bar moved in a horizontal direction without the inner end being moved the same amount............?

GEARING.

Main gear—internal or external?
Is gearing well protected..?
Easily lubricated..?
Variable speed mower...?

MISCELLANEOUS.

Which of the mowers studied do you prefer?

SLIDE DELIVERY HAY RAKE

General Information.

Exercise No. 22.

Name of rake..?
Manufacturer..?
Address ....?
Kind—reel or fork type?

Reel Type.

Reel material—wood or steel?
Length reel...................................feet?
Width swath raked...................................feet?
Number of bars...................................?
Number of teeth on each bar..?
Power transmitted to reel by gearing or chains?
Reel conform to uneven ground.......................................?
Bearing easily lubricated...................................?

Fork Type.

Diameter crank shaft...................................inches?
Number of forks...................................?
Number of teeth to each fork...................................?
Bearings easily lubricated...................................?
Power transmitted to reel by gearing or chain?

Frame.

Material—wood or steel...................................?
Well braced...................................?
Corners reinforced...................................?

Wheels.

Number...................................?
Diameter...................................feet...............................inches?
Width...................................inches?
Easily lubricated..-

Levers.

Number...................................?
Purpose of each?
Can it be thrown out of gear while rake moving ....?
Can it be reversed and made to do work of tedder........ ....?

Miscellaneous.

Which rake studied do you prefer?

SLIDE DELIVERY HAY RAKE

EXERCISE NO. 22.

GENERAL INFORMATION.

Name of rake..?
Manufacturer..?
Address ....?
Kind—reel or fork type?

REEL TYPE.

Reel material—wood or steel?
Length reel..................................feet?
Width swath raked..................................feet?
Number of bars..................................?
Number of teeth on each bar......................................?
Power transmitted to reel by gearing or chains?
Reel conform to uneven ground......................................?
Bearing easily lubricated..................................?

FORK TYPE.

Diameter crank shaft..................................inches?
Number of forks..................................?
Number of teeth to each fork..................................?
Bearings easily lubricated..................................?
Power transmitted to reel by gearing or chain?

FRAME.

Material—wood or steel..................................?
Well braced..................................?
Corners reinforced..................................?

WHEELS.

Number..................................?
Diameter..................................feet..................................inches?
Width..................................inches?
Easily lubricated..-

LEVERS.

Number..................................?
Purpose of each?
Can it be thrown out of gear while rake moving..................................?
Can it be reversed and made to do work of tedder..................................?

MISCELLANEOUS.

Which rake studied do you prefer?

HAY LOADERS

GENERAL INFORMATION. EXERCISE NO. 23.

Name of loader..?
Manufacturer..?
Address ....?
Kind—rake or cylinder type?
Width it takes hay..................................feet?

ELEVATOR.

Maximum height elevator will put hay............feet?
Minimum height elevator will put hay............feet?
Width at top..................................feet?

WHEELS.

Number..................................?
Easily lubricated..................................?

HITCH.

How coupled to wagon..................................?
Can it be uncoupled from top of load?

CYLINDER TYPE.

Cylinder material—wood or steel?
Diameter of cylinder..................................feet?
Number of rows of teeth..................................?
Teeth adjust themselves to ground?
What prevents hay from following cylinder clear around?
Is there anything to prevent hay from following endless apron down between wagon and loader..............................?
Frame material—wood or steel..................................?

RAKE TYPE.

Number bars with rake..................................?
Number rakes to bar..................................?
Bars—material—wood or steel..................................?
Investigate method used to give motion to bars.
Lower rakes adjust themselves to ground...............?
Crank shaft diameter..................................inches?
Crank shaft bearings easily lubricated.....................?
What prevents hay falling between wagon and loader?

MISCELLANEOUS.

Which of loaders studied do you prefer?

HAY LOADERS

EXERCISE NO. 23.

GENERAL INFORMATION.

Name of loader..?
Manufacturer..?
Address ....?
Kind—rake or cylinder type?
Width it takes hay..................................feet?

ELEVATOR.

Maximum height elevator will put hay.............feet?
Minimum height elevator will put hay.............feet?
Width at top..................................feet?

WHEELS.

Number..................................?
Easily lubricated..................................?

HITCH.

How coupled to wagon..................................?
Can it be uncoupled from top of load?

CYLINDER TYPE.

Cylinder material—wood or steel?
Diameter of cylinder..................................feet?
Number of rows of teeth..................................?
Teeth adjust themselves to ground?
What prevents hay from following cylinder clear around?
Is there anything to prevent hay from following endless apron down between wagon and loader..............................?
Frame material—wood or steel..................................?

RAKE TYPE.

Number bars with rake..................................?
Number rakes to bar..................................?
Bars—material—wood or steel.......................................?
Investigate method used to give motion to bars.
Lower rakes adjust themselves to ground...............?
Crank shaft diameter..................................inches?
Crank shaft bearings easily lubricated.....................?
What prevents hay falling between wagon and loader?

MISCELLANEOUS.

Which of loaders studied do you prefer?

GRAIN BINDERS

EXERCISE NO. 24.

GENERAL INFORMATION.

Name of grain binder..?
Manufacturer...?
Address ....?
Width of cut..................................feet?
Right or left hand?

MAIN WHEEL.

Diameter...............................feet..............................inches?
Width.................................inches?
Bearings—plain, ball or roller?
Bearing self-aligning?

GRAIN WHEEL.

Bearings—plain, ball or roller......................................?
Easily lubricated.................................?

MAIN DRIVE CHAIN.

Width of links.................................inches?
Links steel or malleable, with or without pins?
How is chain tightened..?

COUNTER SHAFT.

Self-aligning bearings..?
Bearings—plain, ball or roller......................................?
Can bearings be adjusted for wear..............................?

CRANK SHAFT.

Self-aligning bearers..?
Bearings—plain, ball or roller......................................?
Investigate operation of clutch.

SICKLE.

Number of sections.................................?
How is pitman connected to sickle...............................?
Sections—plain or serrated..?
Is sickle head protected........ ....?
For one revolution of main wheel, how many times does sickle move back and forth........................?

PITMAN.

Material—wood or steel..?
Easily removed if broken...?
Bearings at crank easily lubricated...............................?
Bearing bushing at crank end—iron, babbitt or bronze?

BEVEL GEAR.

Number on machine...?
Can they be adjusted for wear......................................?
Are they protected...............................?

Grain Binders (*Continued*)

ELEVATORS.

Open or closed..................................?
Distance grain elevated above ground..............feet?
Can canvases be tightened or loosened by any other means than straps..................................?

BINDER ATTACHMENT.

Twine tension kind..?
Number of packers..............................?
Number of discharge arms...............................?
Has needle a steel roller in eye...................................?
Kind of butter—canvas, wood or steel......................?
Twine box handy to seat...?
Determine how to thread machine.

TRANSPORTING ATTACHMENT.

Extra wheels easily removed and replaced...............?
Tongue easily adjusted..................................?
Can inside and outside grain divide be adjusted ....?
How narrow and low a place can be gone thru, width....................feet, height.....................feet?

REEL.

How far in front of sickle can it be adjusted, ...feet?
How near ground can it be lowered.....................feet?
Number of slats.................................?
Can reel be folded back.................................?
How many spiders.................................?

BUNDLE CARRIERS.

Unloads by tipping or swinging.................................?
If it hits an obstacle will it move out of way?
Will it scatter the bundles..................................?
Does carrier raise from stubble before swinging into position.................................?

LEVERS.

Number of hand levers..................................?
Number of foot levers..................................?
Purpose of each?
Can they be easily operated from seat.....................?

FRAME.

Form of steel used, angle, I beam, channel or square steel tube.................................?
Do you consider frame strong and well braced ....?

MISCELLANEOUS.

Has binder a tongue truck...?
Which of the grain binders studied do you prefer?

GRAIN BINDERS

GENERAL INFORMATION. EXERCISE NO. 24.

Name of grain binder..?
Manufacturer..?
Address ....?
Width of cut................................feet?
Right or left hand?

MAIN WHEEL.

Diameter...........................feet...........................inches?
Width..................................inches?
Bearings—plain, ball or roller?
Bearing self-aligning?

GRAIN WHEEL.

Bearings—plain, ball or roller.................................?
Easily lubricated.................................?

MAIN DRIVE CHAIN.

Width of links..................................inches?
Links steel or malleable, with or without pins?
How is chain tightened..?

COUNTER SHAFT.

Self-aligning bearings..?
Bearings—plain, ball or roller...................................?
Can bearings be adjusted for wear...........................?

CRANK SHAFT.

Self-aligning bearers...?
Bearings—plain, ball or roller...................................?
Investigate operation of clutch.

SICKLE.

Number of sections.................................?
How is pitman connected to sickle...........................?
Sections—plain or serrated..?
Is sickle head protected...?
For one revolution of main wheel, how many times does sickle move back and forth...........................?

PITMAN.

Material—wood or steel..?
Easily removed if broken..?
Bearings at crank easily lubricated...........................?
Bearing bushing at crank end—iron, babbitt or bronze?

BEVEL GEAR.

Number on machine...?
Can they be adjusted for wear...................................?
Are they protected.................................?

Grain Binders (*Continued*)

ELEVATORS.

Open or closed..............................?
Distance grain elevated above ground..............feet?
Can canvases be tightened or loosened by any other means than straps..............................?

BINDER ATTACHMENT.

Twine tension kind..?
Number of packers..............................?
Number of discharge arms..............................?
Has needle a steel roller in eye..............................?
Kind of butter—canvas, wood or steel....................?
Twine box handy to seat..?
Determine how to thread machine.

TRANSPORTING ATTACHMENT.

Extra wheels easily removed and replaced...............?
Tongue easily adjusted..............................?
Can inside and outside grain divide be adjusted ....?
How narrow and low a place can be gone thru, width....................feet, height....................feet?

REEL.

How far in front of sickle can it be adjusted, ...feet?
How near ground can it be lowered....................feet?
Number of slats..............................?
Can reel be folded back..............................?
How many spiders..............................?

BUNDLE CARRIERS.

Unloads by tipping or swinging..............................?
If it hits an obstacle will it move out of way?
Will it scatter the bundles..............................?
Does carrier raise from stubble before swinging into position..............................?

LEVERS.

Number of hand levers..............................?
Number of foot levers..............................?
Purpose of each?
Can they be easily operated from seat....................?

FRAME.

Form of steel used, angle, I beam, channel or square steel tube..............................?
Do you consider frame strong and well braced ....?

MISCELLANEOUS.

Has binder a tongue truck..?
Which of the grain binders studied do you prefer?

CORN BINDER

GENERAL INFORMATION. EXERCISE NO. 25.

Name of corn binder..?
Manufacturer...?
Address ....?

FRAME.

Form of steel used, angle, I beam, channel or square steel tube.................................?
Do you consider frame strong and well braced ....?

MAIN WHEEL.

Diameter..............................feet..............................inches?
Width..................................inches?
Bearings—plain, ball or roller?
Bearings self-aligning..................................?

SIDE WHEEL.

Bearings—plain, ball or roller?
Easily lubricated..................................?

MAIN DRIVE CHAIN.

Width of links..................................inches?
Links steel or malleable, with or without pins?
How is chain tightened..................................?

COUNTER SHAFT.

Self aligning bearings..................................?
Bearings—plain, ball or roller?
Can bearings be adjusted for wear.............................?

CRANK SHAFT.

Self aligning bearings..................................?
Bearings—plain, ball or roller.....................................?
Inestigate operation or clutch.

SICKLE.

Number of sections..................................?
How is pitman connected to sickle..............................?
Sections—plain or serrated...?
Is sickle head protected..?
For one revolution of main wheel how many times does sickle move back and forth............................?
Any side knives..................................?
Can they be adjusted............................?

PITMAN.

Material—wood or steel..................................?
Easily removed if broken..................................?
Bearings at crank easily lubricated............................?
Bearing bushing at crank end—iron, babbitt or bronze?

Corn Binder

(*Continued*)

BEVEL GEAR.

Number on machine..............................?
Can they be adjusted for wear..................................?
Are they protected..................................?

CARRIER CHAINS.

Number..................................?
Malleable or steel?
Lugs on every link..................................?
How are chains tightened..................................?

BINDER ATTACHMENT.

Twine tension kind..................................?
Number of packers..................................?
Number of discharge arms..................................?
Has needle a steel roller in eye..................................?
Kind of butter—wood, canvas or steel......................?
Twine box handy to seat..................................?
Number of trips..................................?
Does it bind bundles in vertical, inclined or horizontal position..................................?

BUNDLE CARRIERS.

Unloads by tipping or swinging..................................?
If it hits an obstacle will it move out of way ....?
Will it scatter the bundles..................................?
Does carrier raise from stubble before swinging into position..................................?

LEVERS.

Number of hand levers..................................?
Number of foot levers..................................?
Purpose of each..................................?
Can they be easily operated from seat....................?

MISCELLANEOUS.

Has binder a tongue truck..................................?
Which of the grain binders studied do you prefer?

CORN BINDER

GENERAL INFORMATION. EXERCISE NO. 25.

Name of corn binder..?
Manufacturer..?
Address ....?

FRAME.

Form of steel used, angle, I beam, channel or square steel tube.................................?
Do you consider frame strong and well braced ....?

MAIN WHEEL.

Diameter..............................feet..............................inches?
Width...............................inches?
Bearings—plain, ball or roller?
Bearings self-aligning...................................?

SIDE WHEEL.

Bearings—plain, ball or roller?
Easily lubricated.................................?

MAIN DRIVE CHAIN.

Width of links.................................inches?
Links steel or malleable, with or without pins?
How is chain tightened.................................?

COUNTER SHAFT.

Self aligning bearings.................................?
Bearings—plain, ball or roller?
Can bearings be adjusted for wear..............................?

CRANK SHAFT.

Self aligning bearings.................................?
Bearings—plain, ball or roller...................................?
Inestigate operation or clutch.

SICKLE.

Number of sections.................................?
How is pitman connected to sickle..............................?
Sections—plain or serrated...?
Is sickle head protected..?
For one revolution of main wheel how many times does sickle move back and forth.............................?
Any side knives.................................?
Can they be adjusted............................?

PITMAN.

Material—wood or steel.................................?
Easily removed if broken.................................?
Bearings at crank easily lubricated...........................?
Bearing bushing at crank end—iron, babbitt or bronze?

Corn Binder

(Continued)

BEVEL GEAR.

Number on machine..................................?
Can they be adjusted for wear..................................?
Are they protected..................................?

CARRIER CHAINS.

Number..................................?
Malleable or steel?
Lugs on every link..................................?
How are chains tightened..................................?

BINDER ATTACHMENT.

Twine tension kind..................................?
Number of packers..................................?
Number of discharge arms..................................?
Has needle a steel roller in eye..................................?
Kind of butter—wood, canvas or steel......................?
Twine box handy to seat..................................?
Number of trips..................................?
Does it bind bundles in vertical, inclined or horizontal position..................................?

BUNDLE CARRIERS.

Unloads by tipping or swinging..................................?
If it hits an obstacle will it move out of way..................................?
Will it scatter the bundles..................................?
Does carrier raise from stubble before swinging into position..................................?

LEVERS.

Number of hand levers..................................?
Number of foot levers..................................?
Purpose of each..................................?
Can they be easily operated from seat.....................?

MISCELLANEOUS.

Has binder a tongue truck..................................?
Which of the grain binders studied do you prefer?

POTATO DIGGER

GENERAL INFORMATION. EXERCISE No. 26.

Name of potato digger..?
Manufacturer..?
Address ....?

ELEVATOR.

Made of rods or discs?
Rods of uniform length or some higher than others?
Number of rollers that support elevator....................?
Rollers easily oiled.....................................?
Rollers easily removed..................................?

SHAKER.

Investigate its operation?

LEVERS.

Number....................................?
Purpose of each....................................?

WHEELS.

Material—cast iron or steel...?
Lugs....................................?
Boxes protected against dirt...?
Boxes easily lubricated...?

MISCELLANEOUS.

Tongue truck....................................?
Which of the diggers studied do you prefer?

POTATO DIGGER

EXERCISE NO. 26.

GENERAL INFORMATION.

Name of potato digger..?
Manufacturer...?
Address ....?

ELEVATOR.

Made of rods or discs?
Rods of uniform length or some higher than others?
Number of rollers that support elevator...................?
Rollers easily oiled..................................?
Rollers easily removed..................................?

SHAKER.

Investigate its operation?

LEVERS.

Number..................................?
Purpose of each..................................?

WHEELS.

Material—cast iron or steel...?
Lugs..................................?
Boxes protected against dirt......................................?
Boxes easily lubricated..?

MISCELLANEOUS.

Tongue truck..................................?
Which of the diggers studied do you prefer?

ENSILAGE CUTTER

EXERCISE NO. 27.

GENERAL INFORMATION.

Name of ensilage cutter..........?
Manufacturer..........?
Address..........?
Size No..........?
Rated capacity..........tons per hour?
H. P. required..........?

KNIVES.

Kind—radial, curved or spiral?
Length of cutting edge..........inches?
Number..........?
Number bolts holding knife on..........?
Easily removed..........?
Easily sharpened..........?
Knives adjustable to cutting edge..........?

CUTTER HEAD.

R. P. M..........?
Diameter..........inches?
Diameter shaft..........inches?
Bearing easily lubricated..........?
Bearing bushing—babbitt or bronze?
Bearing easily lubricated?
Cutterhead accessible..........?

FEEDING MECHANISM.

Diameter feed rollers..........inches?
Length feed rollers..........inches?
Upper roller adapts itself to feed providing more comes on one side than other..........?
Maximum length of cut..........inches?
Minimum length of cut..........inches?
Self feeding table..........?
Feed rollers driven by gearing or chain?

LEVERS.

Number..........?
Purpose of each?
Reverse lever handy for emergencies..........?

ELEVATOR.

Blower or carrier..........?
Fan attached to cutter head..........?
R. P. M. of blower..........?
How is silage fed to elevator..........?

MISCELANEOUS.

Which cutter studied do you prefer?

ENSILAGE CUTTER

EXERCISE NO. 27.

Name of ensilage cutter..?
Manufacturer...?
Address ....?
Size No...?
Rated capacity.......................................tons per hour?
H. P. required...?

KNIVES.

Kind—radial, curved or spiral?
Length of cutting edge.......................................inches?
Number ....?
Number bolts holding knife on..................................?
Easily removed...?
Easily sharpened...?
Knives adjustable to cutting edge...............................?

CUTTER HEAD.

R. P. M...?
Diameter...................................inches?
Diameter shaft...........................inches?
Bearing easily lubricated.......................................?
Bearing bushing—babbitt or bronze?
Bearing easily lubricated?
Cutterhead accessible...?

FEEDING MECHANISM.

Diameter feed rollers.......................................inches?
Length feed rollers...inches?
Upper roller adapts itself to feed providing more comes on one side than other...................................?
Maximum length of cut...................................inches?
Minimum length of cut...................................inches?
Self feeding table...?
Feed rollers driven by gearing or chain?

LEVERS.

Number......................................?
Purpose of each?
Reverse lever handy for emergencies...........................?

ELEVATOR.

Blower or carrier...?
Fan attached to cutter head...?
R. P. M. of blower...?
How is silage fed to elevator...?

MISCELANEOUS.

Which cutter studied do you prefer?

FEED MILL

EXERCISE NO. 28.

GENERAL INFORMATION.

Name of mill..?
Manufacturer..?
Address ....?
Materials can be ground—shelled corn; corn and cob; corn, cob and shuck; corn cobs; velvet beans in pod; hay?
Capacity shelled corn, pounds per hour..................?
Power—sweep or pulley...?

GRINDING DEVICE.

Buhrs or hammers?
Rigid or loose hammers?
Buhrs—flat, cylindrical or conical?
Buhrs—simple or duplex?
Buhrs material—chilled iron, steel or stone?
R. P. M. of buhrs or hammers......................................?
Safety device for stone, nails, bolts, etc.?
Safety device consist—spring or break pin?
How is adjustment of fineness of feed made..........?

HOPPER.

Divided?
Capacity..................................bushels?
Material—wood, steel or iron?

FEED.

Force or gravity?
Crusher—cast iron or steel?

FRAME.

Material—wood or stone?
Well made and braced...?

LEVERS.

Number................................?
Purpose of each?

MISCELLANEOUS.

Elevator attachment?
Fly wheel?
Drive pulley inside or outside frame?
Which of mills studied do you prefer?

FEED MILL

GENERAL INFORMATION. EXERCISE NO. 28.

Name of mill..?
Manufacturer..?
Address ....?
Materials can be ground—shelled corn; corn and cob; corn, cob and shuck; corn cobs; velvet beans in pod; hay?
Capacity shelled corn, pounds per hour..................?
Power—sweep or pulley..?

GRINDING DEVICE.

Buhrs or hammers?
Rigid or loose hammers?
Buhrs—flat, cylindrical or conical?
Buhrs—simple or duplex?
Buhrs material—chilled iron, steel or stone?
R. P. M. of buhrs or hammers....................................?
Safety device for stone, nails, bolts, etc.?
Safety device consist—spring or break pin?
How is adjustment of fineness of feed made..........?

HOPPER.

Divided?
Capacity...................................bushels?
Material—wood, steel or iron?

FEED.

Force or gravity?
Crusher—cast iron or steel?

FRAME.

Material—wood or stone?
Well made and braced..?

LEVERS.

Number..................................?
Purpose of each?

MISCELLANEOUS.

Elevator attachment?
Fly wheel?
Drive pulley inside or outside frame?
Which of mills studied do you prefer?

FEED MILL

GENERAL INFORMATION.

EXERCISE NO. 28.

Name of mill..?
Manufacturer..?
Address ....?
Materials can be ground—shelled corn; corn and cob; corn, cob and shuck; corn cobs; velvet beans in pod; hay.
Capacity shelled corn, pounds per hour..................?
Power—sweep or pulley..?

GRINDING DEVICE.

Buhrs or hammers?
Rigid or loose hammers?
Buhrs—flat, cylindrical or conical?
Buhrs—simple or duplex?
Buhrs material—chilled iron, steel or stone?
R. P. M. of buhrs or hammers....................................?
Safety device for stone, nails, bolts, etc.?
Safety device consist—spring or break pin?
How is adjustment of fineness of feed made..........?

HOPPER.

Divided?
Capacity...............................bushels?
Material—wood, steel or iron?

FEED.

Force or gravity?
Crusher—cast iron or steel?

FRAME.

Material—wood or stone?
Well made and braced..?

LEVERS.

Number.................................?
Purpose of each?

MISCELLANEOUS.

Elevator attachment?
Fly wheel?
Drive pulley inside or outside frame?
Which of mills studied do you prefer?

FANNING MILLS

EXERCISE No. 29.

GENERAL INFORMATION.

Name of fanning mill..?
Manufacturer..?
Address ....?
Operated by hand or power...?
Capacity cleaning oats...........................bu. per hour?

HOPPER.

Size..................................bushels?
Agitator?
How feed regulated?

SHOE.

Side or end shake..?
Number of screens and sieves that shoes will handle...................................?
Is shoe substantial....................................?

SCREENS.

Size—width...................feet; length.......................feet?
Number...................................?
Kinds of openings, slots, round or..............................?

FAN.

Where located..?
R. P. M...?

MISCELLANEOUS.

Machine well built and substantial............................?
Wood thruout..?
On what principle does machine operate—size, shape or weight of kernel....................................?
What seeds will this machine clean: wheat, rye, oats, barley, peas, beans, clover, alfalfa, lespedeza, timothy, alsike, red top, flax or millet?
Corn grading attachment?
Which of the fanning mills studied do you prefer?

FANNING MILLS

GENERAL INFORMATION. EXERCISE NO. 29.

Name of fanning mill..?
Manufacturer..?
Address..?
Operated by hand or power..?
Capacity cleaning oats............................bu. per hour?

HOPPER.

Size..................................bushels?
Agitator?
How feed regulated?

SHOE.

Side or end shake....................................?
Number of screens and sieves that shoes will handle...............................?
Is shoe substantial....................................?

SCREENS.

Size—width..................feet; length......................feet?
Number....................................?
Kinds of openings, slots, round or..............................?

FAN.

Where located..?
R. P. M...?

MISCELLANEOUS.

Machine well built and substantial.............................?
Wood thruout..?
On what principle does machine operate—size, shape or weight of kernel..?
What seeds will this machine clean: wheat, rye, oats, barley, peas, beans, clover, alfalfa, lespedeza, timothy, alsike, red top, flax or millet?
Corn grading attachment?
Which of the fanning mills studied do you prefer?

MANURE SPREADERS

EXERCISE No. 30.

GENERAL INFORMATION.

Name of manure spreader..?
Manufacturer..?
Address ....?
Size number..?
Contents of box..................................cubic feet?

BOX.

Material—wood or steel?
Contents box......................................cubic feet?
Contents box..bushels?
(1 bushel equals 1.25 cubic feet.)
Height of top of box above ground....................feet?

WHEELS.

Material—wood or steel?
Size—diameter, front............feet; rear..............feet;
width of the front,............feet; rear............feet?
Traction bands or lugs...................................?
Roller bearings.......................................?
Wheels track.................................?
Width of track......................feet.........................inches?
Axle trussed...?
Diameter of axle...............................inches?
Spokes cast in hub and upset in rim?
Rims flanged?

BEATER.

Diameter to tips of teeth...........................feet?
Length of teeth.....................................inches?
Teeth sharp or blunt......................................?
Are teeth in regular or irregular rows?
Teeth driven in or fastened?
Distance beater projects below top of apron..........
inches?
Number of bars...................................?

Manure Spreaders

(*Continued*)

Bars—wood or steel?

Have bars center support..................................?

RAKE.

Has spreader a rake.................................?

Moveable or stationary..?

Number of teeth.................................?

Length of teeth.................................inches?

Is it flexible enough to allow passage of large lumps?

APRON.

Endless or return?

Does apron slide over solid floor?

Has apron rollers.................................?

Number of rollers.................................?

Apron self cleaning.....................................?

Can apron be tightened....................................?

Return apron by power, hand or both?

How are slats fastened to apron.................................?

BEATER DRIVE.

Power transmitted from drive wheel by gear or chain?

Chain—steel or malleable, with or without steel pins?

Chain tightener.................................?

Driven from one or both sides....................................?

When starting up does beater retreat a little at first?

Is power carried from one side to the other thru beater shaft.................................?

Size of beater shaft.................................inches?

Gears, cast or cut?

Gearing well protected..?

Where is clutch located..?

Manure Spreaders

(*Continued*)

Number of revolutions beater makes to one revolution of main wheels..?

How does number of feet traveled by both outside of beater and wheel compare..?
Beater..........................feet; wheel......................feet?

APRON DRIVE.

Ratchet or worm?

Does worm run in oil......................................?

Is ratchet single or double..?

Gearing well protected...?

Gears—cast or cut.....................................?

Distance traveled by apron during one revolution of main wheel—max...........feet; min...........feet?

LEVERS.

Number hand......................................?

Number foot.....................................?

Purpose of each?

Can apron be run against beater without running beater?

Can both forward and backward motion of apron be thrown in at the same time....................................?

Levers easily operated from seat?

MISCELLANEOUS.

Which of spreaders studied do you prefer?

MANURE SPREADERS

GENERAL INFORMATION. EXERCISE NO. 30.

Name of manure spreader..?
Manufacturer..?
Address ....?
Size number...?
Contents of box...cubic feet?

BOX.

Material—wood or steel?
Contents box...cubic feet?
Contents box...bushels?
(1 bushel equals 1.25 cubic feet.)
Height of top of box above ground.....................feet?

WHEELS.

Material—wood or steel?
Size—diameter, front............feet; rear..............feet;
width of the front,............feet; rear............feet?
Traction bands or lugs.................................?
Roller bearings......................................?
Wheels track...................................?
Width of track.......................feet.........................inches?
Axle trussed...?
Diameter of axle................................inches?
Spokes cast in hub and upset in rim?
Rims flanged?

BEATER.

Diameter to tips of teeth.............................feet?
Length of teeth.......................................inches?
Teeth sharp or blunt......................................?
Are teeth in regular or irregular rows?
Teeth driven in or fastened?
Distance beater projects below top of apron..........
inches?
Number of bars..................................?

Manure Spreaders

(*Continued*)

Bars—wood or steel?
Have bars center support.................................?

RAKE.

Has spreader a rake.................................?
Moveable or stationary..?
Number of teeth.................................?
Length of teeth.................................inches?
Is it flexible enough to allow passage of large lumps?

APRON.

Endless or return?
Does apron slide over solid floor?
Has apron rollers.................................?
Number of rollers.................................?
Apron self cleaning.................................?
Can apron be tightened.................................?
Return apron by power, hand or both?
How are slats fastened to apron.................................?

BEATER DRIVE.

Power transmitted from drive wheel by gear or chain?
Chain—steel or malleable, with or without steel pins?
Chain tightener.................................?
Driven from one or both sides.................................?
When starting up does beater retreat a little at first?
Is power carried from one side to the other thru beater shaft.................................?
Size of beater shaft.................................inches?
Gears, cast or cut?
Gearing well protected...?
Where is clutch located...?

Manure Spreaders

(*Continued*)

Number of revolutions beater makes to one revolution of main wheels..................................?

How does number of feet traveled by both outside of beater and wheel compare..................................?

Beater.......................feet; wheel....................feet?

APRON DRIVE.

Ratchet or worm?

Does worm run in oil..................................?

Is ratchet single or double..?

Gearing well protected...?

Gears—cast or cut................................?

Distance traveled by apron during one revolution of main wheel—max...........feet; min...........feet?

LEVERS.

Number hand.................................?

Number foot.................................?

Purpose of each?

Can apron be run against beater without running beater?

Can both forward and backward motion of apron be thrown in at the same time...............................?

Levers easily operated from seat?

MISCELLANEOUS.

Which of spreaders studied do you prefer?

WAGONS

GENERAL INFORMATION. EXERCISE NO. 31.

Name of wagon...?
Manufacturer...?
Address ....?

WHEELS.

Material—wood or steel?
Bore of hubs—straight or tapered?
Diameter of front wheels............feet..............inches?
Diameter of rear wheels..............feet..............inches?
Width of tires.................................?
Thickness of tires............................inches?
Width of track.......................feet.........................inches?
Amount of dish...............................inches?
Amount of front gather...............................inches?
Amount of bottom gather..................................inches?

AXLES.

Material—wood or steel?
Reinforced..................................?
Skein—cast or steel?
Skein diameter.............................inches?
Skein length.................................inches?

BOLSTERS.

Material—wood or steel?
Provided with rings..................................?
Well made and reinforced?

REACH.

Material—wood or steel?
Adjustable as to length?
Metal sleeve thru rear bolster?

FIFTH WHEEL.

Wagon a fifth wheel...?
Well made...?

Wagons

(*Continued*)

BOX.

Size—length....................feet; width....................feet; depth....................feet?

Rubbing plates for bolsters..?

Iron plate to prevent front wheel from rubbing box..................................?

Endgate—straight or broken..?

Seat—well made..................................?

HITCH.

Substantial pole...?

Double trees well made and reinforced?

Drop or army tongue?

Stay chains.......................................?

MISCELLANEOUS.

Brake.................................?

Which of wagons studied do you prefer?

WAGONS

GENERAL INFORMATION. EXERCISE NO. 31.

Name of wagon..?
Manufacturer...?
Address ....?

WHEELS.

Material—wood or steel?
Bore of hubs—straight or tapered?
Diameter of front wheels............feet..............inches?
Diameter of rear wheels..............feet..............inches?
Width of tires.................................?
Thickness of tires...........................inches?
Width of track...................feet...................inches?
Amount of dish.............................inches?
Amount of front gather............................inches?
Amount of bottom gather.................................inches?

AXLES.

Material—wood or steel?
Reinforced.................................?
Skein—cast or steel?
Skein diameter............................inches?
Skein length.................................inches?

BOLSTERS.

Material—wood or steel?
Provided with rings.................................?
Well made and reinforced?

REACH.

Material—wood or steel?
Adjustable as to length?
Metal sleeve thru rear bolster?

FIFTH WHEEL.

Well made...?
Wagon a fifth wheel...?

Wagons

(*Continued*)

BOX.

Size—length....................feet; width....................feet; depth....................feet?

Rubbing plates for bolsters..?

Iron plate to prevent front wheel from rubbing box.................................?

Endgate—straight or broken.......................................?

Seat—well made...................................?

HITCH.

Substantial pole...?

Double trees well made and reinforced?

Drop or army tongue?

Stay chains.......................................?

MISCELLANEOUS.

Brake.................................?

Which of wagons studied do you prefer?

SULKY AND GANG MOLDBOARD PLOW . ASSEMBLING

INSTRUCTIONS. EXERCISE NO. 32.

Take apart and reassemble one sulky or gang moldboard plow.

TAKING APART.

Take plow apart in the following order:

Remove seat.
Remove levers.
Remove coulters.
Remove weed hook.
Remove plow bottom and beams.
Remove wheels.
Call attention of the instructor to the fact that you now have plow dismantled.

REASSEMBLE.

Put plow back together in the reverse order that you took it apart.

REPORT.

Name of plow..?
Manufacturer..?
Address ....?
Size..................................?
Time required to do work..................................minutes?

Date.., 191........

MOWER ASSEMBLING

EXERCISE NO. 33.

INSTRUCTIONS.

Take one mower apart and reassemble and fill out report.

TAKING APART.

Remove each part in the following order, paying attention to how and where each piece goes.

Remove seat.
Sickle.
Pitman.
Inside divider and shoe.
Grass board and outside shoe.
Draw bar.
Levers.
Cutter bar.
Tongue.
Wheels.
Call attention to instructor that you have the mower dismantled.

REASSEMBLE.

Put back together in reverse order that it was taken apart. See that it works all right.

REPORT.

Name of mower..?
Manufacturer..?
Address ....?
Date.., 191.....
Time required to do work..............................hours?
Number of men working..?

Note.—Any broken parts found or any missing parts noted report facts to instructor.

MOWER REPAIR

INSTRUCTIONS. EXERCISE NO. 34.

A mower just as it quits work at the end of the season will be assigned to the class. This mower is to be entirely overhauled, cleaned, adjusted and new parts put in wherever necessary. Go over the machine in the following order:

WHEELS.

Take off and examine pawls, clean, and when put back take up all play on axle by means of washers.

GEARING.

Clean gearing, determine if gears mesh properly; if not, adjust, or if too badly worn, put in new one. Investigate bearings.

CRANK SHAFT.

Investigate bearings.

PITMAN.

Investigate bearings. If pitman badly damaged, put in new one. Straighten bar in front of pitman if it is bent.

CUTTER BAR.

Line up. Investigate ledge plates, line up guards. Examine grass board and inside and outside shoes.

LEVERS.

Investigate operation.

HITCH.

Examine carefully—draft rods, double trees and neck yoke.

Mower Repair

(*Continued*)

After machine is thoroughly overhauled and put in first-class shape, be sure all grease and dirt are off, then paint it.

REPORT.

Name of mower..?
Manufacturer...?
Address ....?
Size No...?
Width of cut..?
Number of years has been operated...........................?
Time required to put it in shape....................hours?
Number of men working..?
Amount of paint used...................................gallons?
List of repairs used:

Catalog No.	Name of Piece	Price

BINDER ATTACHMENT ASSEMBLING

INSTRUCTIONS. EXERCISE NO. 35.

Take apart one binder attachment, reassemble and fill in report as follows:

TAKING APART.

Remove each part in the following order, paying attention to how and where each piece goes:

Remove pitman and rock lever.
Remove main gear.
Remove needle.
Remove packers.
Remove clutch ratchet.
Remove clutch dog.
Remove springs.
Remove knotter hook.
Remove stripper and knife.
Remove twine holder.
Call attention of the instructor to the fact that you now have attachment dismantled.

REASSEMBLE.

Put back together again in the reverse order that you took it apart. See that it works all right.

REPORT.

Name of binder attachment..?
Manufacturer..?
Address ....?
Date..., 191......
Time required to do work..................................hours?
Number of men doing work..?

CORN PLANTER CALIBRATION

INSTRUCTIONS.

EXERCISE NO. 36.

Calibrate a two-row corn planter dropping one, two, three kernels to the hill for 100 hills, using unsorted corn and sorted corn. Keep track of the number of kernels dropped for each hill and record in table. Use plate that will give best results.

REPORT.

Name of planter..?

Manufacturer..?

Address ....?

Variety of corn used..?

UNSORTED CORN

NUMBER OF KERNELS DROPPED	0	1	2	3	4	5	NO. OF PLATE
Set for 1 Kernel							
Set for 2 Kernels							
Set for 3 Kernels							

SORTED CORN

NUMBER OF KERNELS DROPPED	0	1	2	3	4	5	NO. OF PLATE
Set for 1 Kernel							
Set for 2 Kernels							
Set for 3 Kernels							

GRAIN DRILL CALIBRATION

INSTRUCTIONS. EXERCISE NO. 37.

Calibrate a grain drill with two different kinds of seed; make two tests with each seed, sowing different amounts each time.

Get some clean seed from instructor who will tell you the amounts to sow per acre. Set the drill to sow one of the amounts. Measure width of drill and circumference of wheels in feet. Determine the number of revolutions that the wheel must go in order to sow an acre. Place sufficient seed in seed box to sow one-fourth of an acre. Turn wheel until all the seed are gone, keeping count of the number of revolutions. Compute the per cent drill is inaccurate.

REPORT.

Name of drill..?
Manufacturer..?
Address ....?
Width of drill...feet?
Circumference of wheels......................................feet?
Kind of seed............................rates per acre....................?
Kind of seed............................rates per acre....................?
Fill out the following table:

Seed, Kind	Seed, Lbs.	Rev. Wheel Per Acre	Rev. Wheel to Sow Seed	Acres Sowed	Per Cent Error

CORN GRADER TEST

EXERCISE NO. 38.

INSTRUCTIONS.

Using two different corn graders, grade five ears of corn with each. Make report as follows:

REPORT.

GENERAL INFORMATION.

Grader No. 1.

Name ....?

Manufacturer...?

Address ....?

Rated capacity..............................bushels per hour?

Grader No. 2.

Name ....?

Manufacturer...?

Address ....?

Rated capacity..............................bushels per hour?

NAME OF GRADER	No. 1	No. 2
Weight of Tips and Butts		
Weight of Graded Corn		
Weight of Small Corn		
Total		
Per Cent of Good Corn		
Bushels Per Hour		

FANNING MILL TEST

INSTRUCTIONS. EXERCISE NO. 39.

Make two different tests with assigned fanning mill using following seeds in tests:

Clean and grade oats.

Clean and grade..................................

Separate.........................from.........................

Select are sieves you think will do best and try two different sets. Records all results in table below. Amount of seed to use; seed will be supplied by instructor.

REPORT.

Name of fanning mill...?

Manufacturer..?

Address ...., 191......

Date..., 191......

GRAINS	OATS					
RUNS	1	2	1	2	1	2
Screen No.						
Sieves No.						
Wt., Original Grain						
First Grade						
Second Grade						
Third Grade						
Tailings						
Time Started						
Time Finished						
Time Required						
Bushels Per Hour						
R. P. M.						

HAMMERM
BOND

FANNING MILL TEST

Instructions. Exercise No. 33.

Make two different tests with different kinds of seed using following kinds of seeds:

Wheat and garden seeds.

Oats and barley.

Alfalfa .... from........

Select the screen you think will do best and try two different sets. Record all results in table below. Amount of seed to use, etc. will be supplied by instructor.

Results.

Name of fanning mill .... ?

Manufacturer .... ?

Address .... ?

Price .... ?

GRAIN	Oats					
Tests	1	2	1	2	1	2
Screen No.						
Sieve No.						
Wt. Original Grain						
First Grade						
Second Grade						
Third Grade						
Tailings						
Time Started						
Time Finished						
Time Required						
Bushels Per Hour						
R. P. M.						

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